## d-BLOCK

**1.** $H_2S$ (5 moles) reacts completely with acidified aqueous potassium permanganate solution. In this reaction, the number of moles of water produced is **x**, and the number of moles of electrons involved is **y**. The value of $(x + y)$ is ____. **[JEE(Advanced) 2023]**

**2.** Which of the following combination will produce $H_2$ gas? **[JEE(Advanced) 2017]**

(A) Zn metal and NaOH(aq)

(B) Au metal and NaCN(aq) in the presence of air

(C) Cu metal and conc. $HNO_3$

(D) Fe metal and conc. $HNO_3$

**3.** Consider the following list of reagents : **[JEE(Advanced) 2014]**

Acidifeid $K_2Cr_2O_7$, alkaline $KMnO_4$, $CuSO_4$, $H_2O_2$ , $Cl_2$, $O_3$, $FeCl_3$, $HNO_3$ and $Na_2S_2O_3$.

The total number of reagents that can oxidise aqueous iodide to iodine is

## SOLUTIONS

**1. Ans. (18)**

**Sol.** $2\overset{+7}{K}MnO_4 + 5H_2S + 3H_2SO_4 \rightarrow K_2SO_4 + 2\overset{+2}{M}nSO_4 + 5S + 8H_2O$

$x = 8$ (moles of $H_2O$ produced)

$y = 14 - 4 = 10$ (number of electrons involved)

$x + y = 10 + 8 = 18$

**2. Ans. (A)**

**Sol.** (A) $Zn + 2NaOH \longrightarrow Na_2ZnO_2 + H_2$

(B) $4Au + 8NaCN + O_2 + 2H_2O \longrightarrow 4Na[Au(CN)_2] + 4NaOH$

(C) $Cu + 4HNO_3 \longrightarrow Cu(NO_3)_2 + 2NO_2 + 2H_2O$

(conc.)

(D) Formation of passive layer of $Fe_2O_3$ on the surface of Fe and $NO_2$ gas is evolved.

**3. Ans. (7)**

**Sol.** Acidified $K_2Cr_2O_7$, $CuSO_4$, $H_2O_2$, $Cl_2$, $O_3$ $FeCl_3$, $HNO_3$ oxidise aq. iodide to iodine.

Alkaline $KMnO_4$ oxidise aq. iodide to $IO_3^-$

No reaction between iodide & $Na_2S_2O_3$